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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/586,869
Filing Date: June 05, 2000
Appellant(s): HARMAN, PHILIP VICTOR

Gary Fedorochko
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed February 27, 2007, appealing from the Office action mailed June 1, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The Examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The Appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The Appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,370,262	Kawabata	4-2002
6,167,167	Matsugu et al.	12-2000
6,029,173	Meek et al.	2-2000
5,793,900	Nourbakhsh et al.	8-1998

6,055,330 Eleftheriadis 4-2000

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1-3, 13-14, 27, 32, 33, 43-44 are rejected under 35 U.S.C. 102(e) as being anticipated by Kawabata, U.S. Patent No. 6,370,262 ("Kawabata").

1. Referring to claim 1, Kawabata discloses a method of producing a depth map comprising the steps of:

a. identifying at least one object within a 2D image without using distance measurement data [col. 6, lines 19-42 and figure 2. Kawabata explains that the contour of the object O is determined based on contrast data.];

b. allocating an identifying tag to the at least one object [col. 6, lines 48-53. Note that the address, representing the x-y coordinate of the object, is interpreted as the identifying tag.];

c. allocating a depth tag to the at least one object [col. 6, lines 21-53 and figure 2. Kawabata discloses determining the distance of the object, which is 2m in the example given.];

d. determining and defining an outline (contour) of the at least one object [col. 6., lines 19-53. Kawabata discloses determining which positions in the blocks, for which the distance measurements are calculated, correspond to the pixels portions in the contour part. This correspondence is construed as determining and defining an outline of the object.]; and

e. encoding the identifying tag, the depth tag and the outline, of the at least one object to produce a depth map [col. 6, lines 19-53. Note that the depth map in figure 2C is generated by encoding the identifying tag (address), depth tag (distance data), and outline (contour) of the object.].

Referring to claim 2, Kawabata further discloses that the object outline is defined by a series of coordinates [col. 6, lines 44-48].

Referring to claim 3, Kawabata further discloses that the identifying tag is a unique number [col. 6, lines 48-53].

Referring to claim 13, Kawabata further discloses that the depth tag is a numerical value [col. 6, lines 18-24 and figure 2B].

Referring to claim 14, Kawabata further discloses that the numerical value ranges from 0 to 255 [col. 6, lines 21-24 and figure 2B].

Referring to claim 27, see the rejection of claim 1 above. Kawabata discloses a method of encoding a depth map including:

a. allocating an object identifier (address) to an object without using distance measurement data [col. 6, lines 37-53];

b. allocating a depth tag (distance data) to the object [col. 6, lines 21-24 and figure 2B];

c. defining an outline (contour) of the object [col. 6, lines 40-53]; and

d. producing a depth map by encoding the depth tag and the outline of the object [col. 6, lines 19-53. Note that the depth map in figure 2C is generated by encoding the depth tag (distance data) and the outline (contour) of the object.].

Referring to claim 32, Kawabata further discloses that the object outline is defined by at least one geometric shape [figure 2C].

Referring to claim 33, Kawabata further discloses that the geometric shape is defined by the form of the shape and the parameters of the shape [col. 6, lines 31-53].

Referring to claim 43, Kawabata further discloses a method of converting 2D images into stereoscopic images applying a depth map generated above (claim 1) [col. 5, lines 8-15, col. 6, lines 18-64].

Referring to claim 44, Kawabata further discloses a method of converting 2D images into stereoscopic images applying a depth map generated above (claim 27) [col. 5, lines 8-15, col. 6, lines 18-64].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kawabata, U.S. Patent No. 6,370,262 ("Kawabata") and Matsugu et al., U.S. Patent No. 6,167,167 ("Matsugu").

Referring to claim 5, Kawabata does not explicitly disclose that the step of determining the outline further includes tracing the at least one object pixel by pixel. However, this feature was exceedingly well known in the art. For example, Matsugu discloses the step of determining an outline of an object by tracing the object pixel by pixel [col. 15, line 35-col. 16, line 61].

Kawabata and Matsugu are combinable because they are both concerned with image processing methods that determine the outline of an object. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Kawabata's outline determining step in view of Matsugu. The suggestion/motivation for doing so would have been enhance the accuracy of the outline detection process by using a tracing technique [Matsugu, col. 3, line 4-6]. Therefore, it would have been obvious to combine Kawabata with Matsugu to obtain the invention as specified in claim 5.

3. Claims 6-10, 28-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kawabata, U.S. Patent No. 6,370,262 ("Kawabata") and Meek et al. U.S. Patent No. 6,029,173 ("Meek").

Referring to claims 6-8, Kawabata does not explicitly disclose that the step of determining the outline further includes using straight lines, curve approximations, or Bezier curves to approximate the outline of the at least one object. However, these features were exceedingly well known in the art. For example, Meek discloses a step of determining an outline that includes a using straight line, curve, and Bezier curve approximations to approximate the outline of the at least one object [column 6, line 20-30]. The Examiner notes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a straight line, curve, and Bezier curve approximations to approximate an outline as taught by Meek. The reason for doing so would have been to minimize the storage requirements while providing a high level of accuracy in the representation of other-than-straight (curved) features [Meek, column 4, line 32-46]. Therefore, it would have been obvious to combine Kawabata with Meek to obtain the invention as specified in claims 6-8.

Referring to claim 9, Kawabata does not explicitly disclose that the step of determining the outline further includes comparing the object with a library of curves and/or generic geometric shapes to approximate the outline. However, this feature was exceedingly well known in the art. For example, Meek discloses a method and system for representation and use of shape information in geographic databases wherein a step of determining an outline (shape) includes comparing (matching) the object with a library of curves [column 8, line 50-64]and/or generic or geometric shapes to approximate the outline [column 6, line 14-30; column 8, line 20-48]. It

would have been obvious to one of ordinary skill in the art at the time the invention was made to compare the object with a library of curves and/or generic geometric shapes as taught by Meek. The reason for doing so would have been to approximate the outline and minimize the storage requirements while providing a high level of accuracy in the representation of other-than-straight (curved) features [Meek, column 4, line 32-46].

Referring to claim 10, Meek further discloses that the curve and/or generic or geometric shape are scaled to best fit the object [column 8, line 50-64].

Referring to claim 28, Kawabata does not explicitly disclose that the object outline is defined by a series of x, y coordinates, each x, y coordinate being separated by a curve. However, this feature was exceedingly well known in the art. For example, Meek discloses an object outline that is defined by a series of x, y coordinates, each x, y coordinate being separated by a curve [figure 5]. Therefore, it would have been obvious to combine Kawabata and Meek, for the reasons stated above.

Referring to claim 29, Meek discloses further that each curve (other-than-straight segment) is stored in a library and allocated a unique numerical number (index reference value) [column 8, line 60-64].

Referring to claim 30, Meek further discloses that the object outline also includes data on the orientation (rotation) of each curve [column 8, line 50-64].

Referring to claim 31, Meek discloses that each curve is a Bezier curve [column 6, line 14-30].

4. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kawabata, U.S. Patent No. 6,370,262 ("Kawabata") and Nourbakhsh et al., U.S. Patent No. 5,793,900 ("Nourbakhsh.").

Referring to claims 11-12, Kawabata does not disclose that the depth tag includes a color code, wherein white represents one of objects relatively close to the viewer, or objects relatively distant from the viewer and black represents the other. However, this feature was exceedingly well known in the art. For example, Nourbakhsh discloses generating categorical depth maps using passive defocus sensing wherein a depth map is an array of categorical depth values, each value indicating the depth of the scene for a given region such that depth values of 2, 1, and 0 correspond to close, medium, and far, respectively [column 5, line 9-15]. Nourbakhsh further discloses that close regions are lightly shaded, medium regions are medium shaded, and far regions are darkly shaded [Figures 2-7; column 5, line 20-25]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to represent objects relatively close to the viewer as white and objects relatively distant from the viewer with black, as taught by Nourbakhsh. The reason for doing so would have been to give the viewer an impression of depth using varying pixel intensities taking into account that brighter areas logically indicate a closer portion, which is easier to see, and darker areas indicate a distant portion, which is more difficult to see [Nourbakhsh, column 5, line 20-31].

5. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kawabata, U.S. Patent No. 6,370,262 ("Kawabata") and Eleftheriadis et al., U.S. Patent No. 6,055,330 ("Eleftheriadis").

Referring to claim 18, Kawabata does not explicitly disclose the step of tracking the at least one object on successive frames of the image, and determining and assigning depth tags for the at least one object in each respective frame. However, this feature was exceedingly well known in the art. For example, Eleftheriadis discloses the step of tracking at least one object on successive frames of an image, and determining and assigning depth tags for the at least one object in each respective frame [column 18, line 45-55. Eleftheriadis explains that the "objects are adequately tracked" on successive frames].

Kawabata and Eleftheriadis are combinable because they are both concerned with image processing systems for producing depth maps. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the method of Kawabata in view of Eleftheriadis. The suggestion/motivation for doing so would have been to enhance the flexibility of the imaging system by providing tacking capabilities. Therefore, it would have been obvious to combine Kawabata with Eleftheriadis to obtain the invention as specified in claim 18.

6. Claims 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawabata, U.S. Patent No. 6,370,262 ("Kawabata").

Referring to claim 23, Kawabata does not explicitly disclose the step of producing grayscale images that are at a lower resolution than the 2D image. However, Official Notice is taken that producing images at a lower resolution was exceedingly well known in the art.

Therefore, it would have been obvious to modify Kawabata's method to include the step of producing grayscale images that are at a lower resolution than the 2D image. The reason for doing so would have been to enhance the efficiency of the image storage/transmission process.

(10) Response to Argument

Appellant argues that Kawabata does not anticipate independent claims 1 and 27 because "Kawabata fails to teach or suggest identifying at least one object with[in] a 2D image without using distance measurement data." (Brief, page 7). According to Appellant, the term "identifying" is understood to one of ordinary skill as "identifying or determining the outline or shape of the object." (Brief, page 8). While the Examiner does not take such a narrow interpretation of the term "identifying", Kawabata nonetheless discloses identifying the object that meets Appellant's definition. For example, Kawabata discloses that

> [T]he memory portion 14 stores image information with strong contrast in the above image of 30X20 in a positional relation with the pixels. Namely, in the case of the image of FIG. 2A, image portions with strong contrast are pixels portions in a contour part of an image O. Information regarding the pixel portions is stored as emphasized at positions corresponding to the pixel portions in the memory portion. (column 6, lines 37-42)

In light of the disclosure above, Kawabata clearly teaches identifying the object by determining the outline (contour) of the object. Moreover, Kawabata discloses that the contour of the object is determined without using distance measurement data. Particularly, Kawabata explains that the contour portions are determined based on contrast data, not distance data (column 6, lines 37-42). Therefore, contrary to what Appellant contends, Kawabata discloses

identifying at least one object within a 2D image without using distance measurement data, as recited in claims 1 and 27.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the Examiner in the Related Appeals and Interferences section of this Examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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